OIPE

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/054,680

DATE: 02/12/2002
TIME: 12:08:02

Input Set : A:\LEX-0301-USA SEQLIST.txt
Output Set: N:\CRF3\02122002\J054680.raw

ENTERED

```
  4 <110> APPLICANT: Friddle, Carl Johan
  5        Hilbun, Erin
  7 <120> TITLE OF INVENTION: Novel Human Ion Exchanger Proteins and Polynucleotides
Encoding the
  8        Same
 10 <130> FILE REFERENCE: LEX-0301-USA
C--> 12 <140> CURRENT APPLICATION NUMBER: US/10/054,680
C--> 12 <141> CURRENT FILING DATE: 2002-01-22
 12 <150> PRIOR APPLICATION NUMBER: US 60/263,384
 13 <151> PRIOR FILING DATE: 2001-01-23
 15 <160> NUMBER OF SEQ ID NOS: 5
 17 <170> SOFTWARE: FastSEQ for Windows Version 4.0
 19 <210> SEQ ID NO: 1
 20 <211> LENGTH: 2766
 21 <212> TYPE: DNA
 22 <213> ORGANISM: homo sapiens
 24 <400> SEQUENCE: 1
 25 atggcgtggt taaggttgca gcctctcacc tctgccttcc tccattttgg gctggttacc 60
 26 tttgtgctct tcctgaatgg tcttcgagca gaggctggtg gctcagggga cgtgccaagc 120
 27 acagggcaga acaatgagtc ctgttcaggg tcatcggact gcaaggaggg tgtcatcctg 180
 28 ccaatctggt acccggagaa cccttccctt ggggacaaga ttgccagggt cattgtctat 240
 29 tttgtggccc tgatatacat gttccttggg gtgtccatca ttgctgaccg cttcatggca 300
 30 tctattgaag tcatcacctc tcaagagagg gaggtgacaa ttaagaaacc caatggagaa 360
 31 accagcacaa ccactattcg ggtctggaat gaaactgtct ccaacctgac ccttatggcc 420
 32 ctgggttcct ctgctcctga gatactcctc tctttaattg aggtgtgtgg tcatgggttc 480
 33 attgctggtg atctgggacc ttctaccatt gtagggagtg cagccttcaa catgttcatc 540
 34 atcattggca tctgtgtcta cgtgatccca gacggagaga ctcgcaagat caagcatcta 600
 35 cgagtcttct tcatcaccgc tgcttggagt atctttgcct acatctggct ctatatgatt 660
 36 ctggcagtct tctcccctgg tgtggtccag gtttgggaag gcctcctcac tctcttcttc 720
 37 tttccagtgt gtgtccttct ggcctgggtg gcagataaac gactgctctt ctacaaatac 780
 38 atgcacaaaa agtaccgcac agacaaacac cgaggaatta tcatagagac agagggtgac 840
 39 caccctaagg gcattgagat ggatgggaaa atgatgaatt cccattttct agatgggaac 900
 40 ctggtgcccc tggaagggaa ggaagtggat gagtcccgca gagagatgat ccggattctc 960
 41 aaggatctga agcaaaaaca cccagagaag gacttagatc agctggtgga gatggccaat 1020
 42 tactatgctc tttcccacca acagaagagc cgcgccttct accgtatcca agccactcgt 1080
 43 atgatgactg tgtgcaggcaa tatcctgaag aaacatgcag cagaacaagc caagaaggcc 1140
 44 tccagcatga gcgaggtgca caccgatgag cctgaggact ttatttccaa ggtcttcttt 1200
 45 gacccatgtt cttaccagtg cctggagaac tgtgggggctg tactcctgac agtggtgagg 1260
 46 aaaggggggag acatgtcaaa gaccatgtat gtggactaca aaacagagga tggttctgcc 1320
 47 aatgcagggg ctgactatga gttcacagag ggcacggtgg ttctgaagcc aggagagacc 1380
 48 cagaaggagt ctccgtgggg cataattgat gacgacattt ttgaggagga tgaacacttc 1440
 49 tttgtaaggt tgagcaatgt ccgcatagag gaggagcagc cagaggaggg gatgcctcca 1500
 50 gcaatattca acagtcttcc cttgcctcgg gctgtcctag cctccccttg tgtggccaca 1560
 51 gttaccatct ggatgatga ccatgcaggc atcttcactt ttgaatgtga tactattcat 1620
```

RAW SEQUENCE LISTING
PATENT APPLICATION: US/10/054,680

DATE: 02/12/2002
TIME: 12:08:02

Input Set : A:\LEX-0301-USA SEQLIST.txt
Output Set: N:\CRF3\02122002\J054680.raw

```
52 gtcagtgaga gtattggtgt tatggaggtc aaggttctgc ggacatcagg tgcccggggt 1680
53 acagtcatcg tcccctttag gacagtagaa gggacagcca agggtggcgg tgaggacttt 1740
54 gaagacacat atggggagtt ggaattcaag aatgatgaaa ctgtgaaaac cataagggtt 1800
55 aaaatagtag atgaggagga atacgaaagg caagagaatt tcttcattgc ccttggtgaa 1860
56 ccgaaatgga tggaacgtgg aatatcagat gtgacagaca ggaagctgac tatggaagaa 1920
57 gaggaggcca agaggatagc agagatggga aagccagtat tgggtgaaca ccccaaacta 1980
58 gaagtcatca ttgaagagtc ctatgagttc aagactacgg tggacaaact gatcaagaag 2040
59 acaaacctgg ccttggttgt ggggacccat tcctggaggg accagttcat ggaggccatc 2100
60 accgtcagtg cagcagggga tgaggatgag gatgaatccg gggaggagag gctgccctcc 2160
61 tgctttgact acgtcatgca cttcctgact gtcttctgga aggtgctgtt tgcctgtgtg 2220
62 cccccacag agtactgcca cggctgggcc tgcttcgccg tctccatcct catcattggc 2280
63 atgctcaccg ccatcattgg ggacctggcc tcgcacttcg gctgcaccat tggtctcaaa 2340
64 gattcagtca cagctgttgt tttcgtggca tttggcacct ctgtcccaga tacgtttgcc 2400
65 agcaaagctg ctgccctcca ggatgtatat gcagacgcct ccattggcaa cgtgacgggc 2460
66 agcaacgccg tcaatgtctt cctgggcatc ggcctggcct ggtccgtggc cgccatctac 2520
67 tgggctctgc agggacagga gttccacgtg tcggccggca cactggcctt ctccgtcacc 2580
68 ctcttcacca tctttgcatt tgtctgcatc agcgtgctct tgtaccgaag gcggccgcac 2640
69 ctgggagggg agcttggtgg cccccgtggc tgcaagctcg ccacaacatg gctctttgtg 2700
70 agcctgtggc tcctctacat actctttgcc acactagagg cctattgcta catcaagggg 2760
71 ttctaa                                                         2766
```

73 <210> SEQ ID NO: 2
74 <211> LENGTH: 921
75 <212> TYPE: PRT
76 <213> ORGANISM: homo sapiens
78 <400> SEQUENCE: 2

```
79 Met Ala Trp Leu Arg Leu Gln Pro Leu Thr Ser Ala Phe Leu His Phe
80  1               5                   10                  15
81 Gly Leu Val Thr Phe Val Leu Phe Leu Asn Gly Leu Arg Ala Glu Ala
82              20                  25                  30
83 Gly Gly Ser Gly Asp Val Pro Ser Thr Gly Gln Asn Asn Glu Ser Cys
84          35                  40                  45
85 Ser Gly Ser Ser Asp Cys Lys Glu Gly Val Ile Leu Pro Ile Trp Tyr
86      50                  55                  60
87 Pro Glu Asn Pro Ser Leu Gly Asp Lys Ile Ala Arg Val Ile Val Tyr
88 65                  70                  75                  80
89 Phe Val Ala Leu Ile Tyr Met Phe Leu Gly Val Ser Ile Ile Ala Asp
90              85                  90                  95
91 Arg Phe Met Ala Ser Ile Glu Val Ile Thr Ser Gln Glu Arg Glu Val
92              100                 105                 110
93 Thr Ile Lys Lys Pro Asn Gly Glu Thr Ser Thr Thr Thr Ile Arg Val
94      115                 120                 125
95 Trp Asn Glu Thr Val Ser Asn Leu Thr Leu Met Ala Leu Gly Ser Ser
96      130                 135                 140
97 Ala Pro Glu Ile Leu Leu Ser Leu Ile Glu Val Cys Gly His Gly Phe
98 145                 150                 155                 160
99 Ile Ala Gly Asp Leu Gly Pro Ser Thr Ile Val Gly Ser Ala Ala Phe
100             165                 170                 175
101 Asn Met Phe Ile Ile Ile Gly Ile Cys Val Tyr Val Ile Pro Asp Gly
102             180                 185                 190
```

RAW SEQUENCE LISTING   DATE: 02/12/2002
PATENT APPLICATION: US/10/054,680   TIME: 12:08:02

Input Set : A:\LEX-0301-USA SEQLIST.txt
Output Set: N:\CRF3\02122002\J054680.raw

```
103 Glu Thr Arg Lys Ile Lys His Leu Arg Val Phe Phe Ile Thr Ala Ala
104         195             200             205
105 Trp Ser Ile Phe Ala Tyr Ile Trp Leu Tyr Met Ile Leu Ala Val Phe
106         210             215             220
107 Ser Pro Gly Val Val Gln Val Trp Glu Gly Leu Leu Thr Leu Phe Phe
108 225             230             235             240
109 Phe Pro Val Cys Val Leu Leu Ala Trp Val Ala Asp Lys Arg Leu Leu
110             245             250             255
111 Phe Tyr Lys Tyr Met His Lys Lys Tyr Arg Thr Asp Lys His Arg Gly
112             260             265             270
113 Ile Ile Ile Glu Thr Glu Gly Asp His Pro Lys Gly Ile Glu Met Asp
114         275             280             285
115 Gly Lys Met Met Asn Ser His Phe Leu Asp Gly Asn Leu Val Pro Leu
116         290             295             300
117 Glu Gly Lys Glu Val Asp Glu Ser Arg Arg Glu Met Ile Arg Ile Leu
118 305             310             315             320
119 Lys Asp Leu Lys Gln Lys His Pro Glu Lys Asp Leu Asp Gln Leu Val
120             325             330             335
121 Glu Met Ala Asn Tyr Tyr Ala Leu Ser His Gln Gln Lys Ser Arg Ala
122             340             345             350
123 Phe Tyr Arg Ile Gln Ala Thr Arg Met Met Thr Gly Ala Gly Asn Ile
124             355             360             365
125 Leu Lys Lys His Ala Ala Glu Gln Ala Lys Lys Ala Ser Ser Met Ser
126         370             375             380
127 Glu Val His Thr Asp Glu Pro Glu Asp Phe Ile Ser Lys Val Phe Phe
128 385             390             395             400
129 Asp Pro Cys Ser Tyr Gln Cys Leu Glu Asn Cys Gly Ala Val Leu Leu
130             405             410             415
131 Thr Val Val Arg Lys Gly Gly Asp Met Ser Lys Thr Met Tyr Val Asp
132             420             425             430
133 Tyr Lys Thr Glu Asp Gly Ser Ala Asn Ala Gly Ala Asp Tyr Glu Phe
134         435             440             445
135 Thr Glu Gly Thr Val Val Leu Lys Pro Gly Glu Thr Gln Lys Glu Phe
136         450             455             460
137 Ser Val Gly Ile Ile Asp Asp Asp Ile Phe Glu Glu Asp Glu His Phe
138 465             470             475             480
139 Phe Val Arg Leu Ser Asn Val Arg Ile Glu Glu Glu Gln Pro Glu Glu
140             485             490             495
141 Gly Met Pro Pro Ala Ile Phe Asn Ser Leu Pro Leu Pro Arg Ala Val
142             500             505             510
143 Leu Ala Ser Pro Cys Val Ala Thr Val Thr Ile Leu Asp Asp Asp His
144         515             520             525
145 Ala Gly Ile Phe Thr Phe Glu Cys Asp Thr Ile His Val Ser Glu Ser
146         530             535             540
147 Ile Gly Val Met Glu Val Lys Val Leu Arg Thr Ser Gly Ala Arg Gly
148 545             550             555             560
149 Thr Val Ile Val Pro Phe Arg Thr Val Glu Gly Thr Ala Lys Gly Gly
150             565             570             575
151 Gly Glu Asp Phe Glu Asp Thr Tyr Gly Glu Leu Glu Phe Lys Asn Asp
```

RAW SEQUENCE LISTING   DATE: 02/12/2002
PATENT APPLICATION: US/10/054,680   TIME: 12:08:02

Input Set : A:\LEX-0301-USA SEQLIST.txt
Output Set: N:\CRF3\02122002\J054680.raw

```
152              580                 585                 590
153 Glu Thr Val Lys Thr Ile Arg Val Lys Ile Val Asp Glu Glu Glu Tyr
154          595                 600                 605
155 Glu Arg Gln Glu Asn Phe Phe Ile Ala Leu Gly Glu Pro Lys Trp Met
156     610                 615                 620
157 Glu Arg Gly Ile Ser Asp Val Thr Asp Arg Lys Leu Thr Met Glu Glu
158 625                 630                 635                 640
159 Glu Glu Ala Lys Arg Ile Ala Glu Met Gly Lys Pro Val Leu Gly Glu
160              645                 650                 655
161 His Pro Lys Leu Glu Val Ile Ile Glu Glu Ser Tyr Glu Phe Lys Thr
162          660                 665                 670
163 Thr Val Asp Lys Leu Ile Lys Lys Thr Asn Leu Ala Leu Val Val Gly
164          675                 680                 685
165 Thr His Ser Trp Arg Asp Gln Phe Met Glu Ala Ile Thr Val Ser Ala
166     690                 695                 700
167 Ala Gly Asp Glu Asp Glu Asp Glu Ser Gly Glu Glu Arg Leu Pro Ser
168 705                 710                 715                 720
169 Cys Phe Asp Tyr Val Met His Phe Leu Thr Val Phe Trp Lys Val Leu
170              725                 730                 735
171 Phe Ala Cys Val Pro Pro Thr Glu Tyr Cys His Gly Trp Ala Cys Phe
172              740                 745                 750
173 Ala Val Ser Ile Leu Ile Ile Gly Met Leu Thr Ala Ile Ile Gly Asp
174          755                 760                 765
175 Leu Ala Ser His Phe Gly Cys Thr Ile Gly Leu Lys Asp Ser Val Thr
176     770                 775                 780
177 Ala Val Val Phe Val Ala Phe Gly Thr Ser Val Pro Asp Thr Phe Ala
178 785                 790                 795                 800
179 Ser Lys Ala Ala Ala Leu Gln Asp Val Tyr Ala Asp Ala Ser Ile Gly
180              805                 810                 815
181 Asn Val Thr Gly Ser Asn Ala Val Asn Val Phe Leu Gly Ile Gly Leu
182              820                 825                 830
183 Ala Trp Ser Val Ala Ala Ile Tyr Trp Ala Leu Gln Gly Gln Glu Phe
184          835                 840                 845
185 His Val Ser Ala Gly Thr Leu Ala Phe Ser Val Thr Leu Phe Thr Ile
186     850                 855                 860
187 Phe Ala Phe Val Cys Ile Ser Val Leu Leu Tyr Arg Arg Arg Pro His
188 865                 870                 875                 880
189 Leu Gly Gly Glu Leu Gly Gly Pro Arg Gly Cys Lys Leu Ala Thr Thr
190              885                 890                 895
191 Trp Leu Phe Val Ser Leu Trp Leu Leu Tyr Ile Leu Phe Ala Thr Leu
192              900                 905                 910
193 Glu Ala Tyr Cys Tyr Ile Lys Gly Phe
194          915                 920
197 <210> SEQ ID NO: 3
198 <211> LENGTH: 1863
199 <212> TYPE: DNA
200 <213> ORGANISM: homo sapiens
202 <400> SEQUENCE: 3
203 atggcgtggt taaggttgca gcctctcacc tctgccttcc tccattttgg gctggttacc 60
```

```
204 tttgtgctct tcctgaatgg tcttcgagca gaggctggtg gctcagggga cgtgccaagc 120
205 acagggcaga acaatgagtc ctgttcaggg tcatcggact gcaaggaggg tgtcatcctg 180
206 ccaatctggt acccggagaa cccttccctt ggggacaaga ttgccagggt cattgtctat 240
207 tttgtggccc tgatatacat gttccttggg gtgtccatca ttgctgaccg cttcatggca 300
208 tctattgaag tcatcacctc tcaagagagg gaggtgacaa ttaagaaacc caatggagaa 360
209 accagcacaa ccactattcg ggtctggaat gaaactgtct ccaacctgac ccttatggcc 420
210 ctgggttcct ctgctcctga gatactcctc tctttaattg aggtgtgtgg tcatgggttc 480
211 attgctggtg atctgggacc ttctaccatt gtagggagtg cagccttcaa catgttcatc 540
212 atcattggca tctgtgtcta cgtgatccca gacggagaga ctcgcaagat caagcatcta 600
213 cgagtcttct tcatcaccgc tgcttggagt atctttgcct acatctggct ctatatgatt 660
214 ctggcagtct tctcccctgg tgtggtccag gtttgggaag gcctcctcac tctcttcttc 720
215 tttccagtgt gtgtccttct ggcctgggtg gcagataaac gactgctctt ctacaaatac 780
216 atgcacaaaa agtaccgcac agacaaacac cgaggaatta tcatagagac agagggtgac 840
217 caccctaagg gcattgagat ggatgggaaa atgatgaatt cccattttct agatgggaac 900
218 ctggtgcccc tggaagggaa ggaagtggat gagtcccgca gagagatgat ccggattctc 960
219 aaggatctga agcaaaaaca cccagagaag gacttagatc agctggtgga gatggccaat 1020
220 tactatgctc tttcccacca acagaagagc cgcgccttct accgtatcca agccactcgt 1080
221 atgatgactg gtgcaggcaa tatcctgaag aaacatgcag cagaacaagc caagaaggcc 1140
222 tccagcatga gcgaggtgca caccgatgag cctgaggact ttatttccaa ggtcttcttt 1200
223 gacccatgtt cttaccagtg cctggagaac tgtgggggctg tactcctgac agtggtgagg 1260
224 aaagggggag acatgtcaaa gaccatgtat gtggactaca aaacagagga tggttctgcc 1320
225 aatgcagggg ctgactatga gttcacagag ggcacggtgg ttctgaagcc aggagagacc 1380
226 cagaaggagt tctccgtggg cataattgat gacgacattt ttgaggagga tgaacacttc 1440
227 tttgtaaggt tgagcaatgt ccgcatagag gaggagcagc cagaggaggg gatgcctcca 1500
228 gcaatattca acagtcttcc cttgcctcgg gctgtcctag cctccccttg tgtggccaca 1560
229 gttaccatct tggatgatga ccatgcaggc atcttcactt ttgaatgtga tactattcat 1620
230 gtcagtgaga gtattggtgt tatggaggtc aaggttctgc ggacatcagg tgcccggggt 1680
231 acagtcatcg tcccctttag gacagtagaa gggacagcca agggtggcgg tgaggacttt 1740
232 gaagacacat atgggggagtt ggaattcaag aatgatgaaa ctgtatgtga cagacaggaa 1800
233 gctgactatg gaagaagagg aggccaagag gatagcagag atgggaaagc cagtattggg 1860
234 tga                                                                 1863
```

236 <210> SEQ ID NO: 4
237 <211> LENGTH: 620
238 <212> TYPE: PRT
239 <213> ORGANISM: homo sapiens
241 <400> SEQUENCE: 4

```
242 Met Ala Trp Leu Arg Leu Gln Pro Leu Thr Ser Ala Phe Leu His Phe
243 1               5                   10                  15
244 Gly Leu Val Thr Phe Val Leu Phe Leu Asn Gly Leu Arg Ala Glu Ala
245             20                  25                  30
246 Gly Gly Ser Gly Asp Val Pro Ser Thr Gly Gln Asn Asn Glu Ser Cys
247         35                  40                  45
248 Ser Gly Ser Ser Asp Cys Lys Glu Gly Val Ile Leu Pro Ile Trp Tyr
249     50                  55                  60
250 Pro Glu Asn Pro Ser Leu Gly Asp Lys Ile Ala Arg Val Ile Val Tyr
251 65                  70                  75                  80
252 Phe Val Ala Leu Ile Tyr Met Phe Leu Gly Val Ser Ile Ile Ala Asp
253             85                  90                  95
254 Arg Phe Met Ala Ser Ile Glu Val Ile Thr Ser Gln Glu Arg Glu Val
```

VERIFICATION SUMMARY   DATE: 02/12/2002
PATENT APPLICATION: US/10/054,680   TIME: 12:08:03

Input Set : **A:\LEX-0301-USA SEQLIST.txt**
Output Set: **N:\CRF3\02122002\J054680.raw**

L:12 M:270 C: Current Application Number differs, Replaced Current Application No
L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date